Survey results

Adrian Barnett, 25 March 2019

There were 53 responses.

## Of the following 20 problems in research, please select which five (or fewer) you think are the most important to address. Please focus on the most important national issues for Australia.

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| --- | --- |
| Problem | count |
| Inappropriate academic incentives publish or perish reward systems focus on citations especially in top journals rather than research resulting in real changes to practice | 34 |
| Insufficient training of researchers and supervisors in research reproducibility and basic study design | 31 |
| Poorly conducted research e.g., failure to randomise failure to blind | 20 |
| Too much competition for too little funding[[1]](#footnote-1) | 19 |
| Lack of involvement of statisticians and epidemiologists on research teams | 18 |
| Over emphasis on p-values statistical significance and re analysing data until statistical significance is achieved | 18 |
| Poor research culture of institutions research groups | 14 |
| Unwillingness of journals and researchers to publish null results or replication studies | 14 |
| Suppression sanitisation of unfavourable or commercially damaging results | 11 |
| Insufficient use of research design and reporting guidelines EQUATOR | 10 |
| Low numbers of replication studies performed for lack of funding or other reasons | 10 |
| Discrimination against female researchers | 8 |
| Low rates of data and code sharing | 7 |
| Researchers and the media hyping preliminary results that give the public false hope | 7 |
| Insufficient national oversight of universities and research institutes | 6 |
| Training too many PhD students given the level of research funding available | 5 |
| Low rates of registration of protocols and clinical trials | 4 |
| Resistance to correct or retract flawed papers | 4 |
| Poor quality systematic reviews and meta analyses | 3 |
| Predatory journals and conferences | 3 |

## 

## Are there other major problems in research in Australia that we should consider at the meeting?

* Journal system of peer review is clearly broken. The response times are too long, the editors no longer read reviewers comments and make specific recommendations, and editors in general seem to have abandoned making editorial decisions. It seems that there may be a need for a designated statistical advisor to editors in journals across the board, because data is abundant and quantitative methods are being used in fields that are lagging.
* Failing to communicate the inherent uncertainty of research findings in general while still emphasizing the value of objective data collection
* (1) Lack of independent (not internal), ongoing transparent rigorous review and benchmarking analyses of all ARC & NHMRC grant data and peer-review processes; (2) Insufficient training of HDRs and above in research translation, IP and associated issues to progress discoveries from the benchside to the beside and boardroom, i.e., how can more medical research achieve genuine impact and benefits for society when the vast majority of researchers have not been trained in doing and peer-reviewing research translation and commercialisation? [largely due to the perverse incentive of ‘publish or perish’]; (3) The approach by universities to facilitating genuine non-academia career pathways for PhD students has been slow and reactive, i.e., 20 to 30 years too late! See also <https://thesiswhisperer.com/2019/03/13/anti-phd/> (4) ‘Interdisciplinary research has consistently lower funding success’ (Bromham et al., 29 June 2016) <https://www.nature.com/articles/nature18315> <https://www.nature.com/news/meet-the-challenge-of-interdisciplinary-science-1.20185> <https://www.nature.com/news/interdisciplinary-proposals-struggle-to-get-funded-1.20189> i.e., a lot of boring, derivative and unidimensional research gets funded in Australia because it is considered ‘excellent’ by traditional siloed academic standards; and the fact that the interdisciplinary research training needs to start early from Honours / Masters level. See also: “A major reason that pervasive problems such as poor quality publications, hyper-competition and hype have been allowed to fester is the miracle-machine ideology: give us money, leave us alone and we’ll solve the world’s problems… Vast improvements in the scientific system could be had if science agencies strengthened the ties that link research agendas to societal needs, and counteract the perverse incentives that commit scientists to careers measured by publications and grant dollars rather than the creation of socially valuable knowledge.” <http://www.nature.com/news/kill-the-myth-of-the-miracle-machine-1.22283> <https://www.thenewatlantis.com/publications/saving-science> <https://theconversation.com/co-operative-research-revolution-could-answer-call-to-transform-science-and-society-81447>
* Educating the public about the positive qualities of research - negative publicity about research reaches the public, but most of the public has no idea of the rigors of research.
* There is no training on HOW to translate (for public policy) or commercialise (for profit) research. This is particularly important most funding is tied to engagement and impact and all universities expect researchers to bring in external money/funding.
* Preregistration
* Too little government willingness to let go of the ‘picking-winners’ approach
* Research engagement of clinicians without appropriate training, supervision, time or support.
* Not enough funding available for those from smaller research groups.
* The grant review process. Reviewers in competition with grant applicants leads to less robust review. Grants awarded to the experienced researcher rather than to the innovative project (from a less experienced researcher)
* There are concerns about PhD students not being able to find jobs after they are conferred. However, I believe that the research skills are required and relevant for industry. There needs to be greater engagement with industry to support research.
* Focus of research positions in academic setting rather than support/funding positions for researchers embedded in the clinical setting (which leads to greater TRIP focused research)
* There is a huge lack of training in statistics, including study design and ethical considerations, for scientists in Australia. In some disciplines this only occurs in Honours and students have had a huge gap between their last statistics/maths class at school and encountering statistics for their research. A five day intensive course as often occurs in Honours is insufficient to get across the critical thinking that comes through statistical training and thinking! Frequently the supervisors are ill equipped to support the students in statistics and statistical consulting groups at universities are squeezed due to the high numbers of staff and students needing assistance.
* framework to measure, evaluate and report research impact
* 1. salami slicing. 2. ‘black box’ analysis enabled by modern point and click stats packages without understanding the underlying principles - leads to ‘wrong’ analysis. 3. poorly designed, implemented and reported pre-clinical research (i.e. animals)…..aim of researchers is to get funding or a degree rather than improve (animal or human) health - ref Prof Malcolm Macleod for more information. 4. p-value problem is important - ref John Ioannidis and Ken Rothman
* Lack of co-ordination of research efforts - competing rather than collaborating when we are such a small community.
* More constructive partnerships with sectors outside of academia. Developing a better appreciation of the ‘real world’ translation and implementation of evidence into health policy, practice and planning. A clearer realisation that ‘innovation’ (whilst good) also requires resources and staff ‘on the ground’.
* Current lack of guiding framework for standards relating to clinical trials, the commission have drafted a clinical trials governance framework. This will affect accreditation standard for all hospitals/health providers conducting clinical research and will assist and guide practice. This topic should be acknowledged and discussed on the day.
* The more successful you become as a researcher the greater the chance of being asked to do non research work.
* There is a lack of a coordinated approach to translation of research findings. The onus falls on the researcher to tackle policy makers etc, but this is rarely factored in to grant applications and therefore falls down - leaving the researcher feeling like all the planning and effort involved in conducting a high quality, rigorous study was wasted. Predatory journals are also a big concern - how is the general public/media to decipher what’s real and what’s not?
* The major issue is the high stress funding system which encourages (or forces) unethical scientific practices. While competitiveness should be encouraged, current funding system only encourages stressful management of research projects and often results in bad quality data being published, for the sake of publications rather than ensuring bigger picture publications or answering key questions.
* More financial support needed in terms of grants for PhD students - scholarships only cover cost of living, need more financial assistance available for the research itself.
* 1. Failure to build on previous research - by doing systematic reviews of previous research before new research. 2. Poor research questions that focus on a do-able publication rather than as a step to answering a real problem (Pasteur’s Quadrant). 3. Weak collaborative research networks, particularly for multicentre basic science.
* Lack of applied researchers or research with practical application

## Which of the following 21 potential policy changes or actions would you endorse to help improve research in Australia?

|  |  |
| --- | --- |
| Policy | count |
| Better and continued training in research methods at all career stages ideally using a national model that is available to all researchers | 22 |
| That reproducibility training and practice becomes integrated into Masters and PhDs | 19 |
| Requiring that all Australian trials be registered make a protocol available and publish their results with consequences for researchers who fail to comply | 17 |
| A national inquiry into the burden of research ethics and governance in health and medical research Australia | 16 |
| That Australia implement a program similar to the UK s foresight scheme where policy makers and academics work together for 12 months to develop evidence based policies on important national issues | 16 |
| Lobbying universities to downplay league tables like the Times Higher Education tables and focus on real benefits to patients and the public | 14 |
| Australia to set up a James Lind Alliance to bring together clinicians patients and carers to discuss research priorities | 12 |
| Requiring research data to be deposited in an open repository after studies are published with a controlled access option for sensitive data | 12 |
| Revising academic incentives so that replication reproducibility studies and open practices are highly valued | 12 |
| New national funding for fellowships for statisticians and health economists | 11 |
| Mandating the inclusion of accredited statisticians and data management experts on research teams | 9 |
| Policies to encourage wider use of project management tools such as *github* and training in version control | 8 |
| A national system of random audits that will provide a detailed examination of the quality of a researcher or research group Only around 1 of researchers would be audited | 7 |
| Awarding research funding based on the national burden of disease rather than the current investigator driven model | 7 |
| That specific funding be made available for meta research researching the research process and journalology the science of publication practices | 7 |
| That some funding be specifically set aside to fund replication studies | 6 |
| That specific funding be set aside for truly innovative projects | 6 |
| New national funding specifically for researchers to write up unpublished null findings recent or past | 5 |
| That a national advisory board for research integrity be created see this recent article on plans in the US | 5 |
| Requiring a replication component as part of grant proposals | 3 |
| Educating students and researchers about scholarly communication including predatory conferences and journals | 2 |

## Please suggest other possible policy changes or actions

* Reduce the emphasis on citations and focus more on impact in the real world
* Generally any workable set of bipartisan/multi-sector policies and mechanisms that increase and maintain transparency (and hence accountability) across the entire research ecosystem. See also: The current challenge for data science and technology (DST) in healthcare is moving beyond the “dancing bear” stage, where “the wonder is not how well the bear dances, but that he dances at all.” It’s time for DST to evolve past the novelty publications and the click bait, and demonstrate its ability to materially impact health and disease. <https://www.forbes.com/sites/davidshaywitz/2019/01/16/novartis-ceo-who-wanted-to-bring-tech-into-pharma-now-explains-why-its-so-hard/amp/> The health care innovation bubble <https://www.sciencedirect.com/science/article/pii/S2213076417301707> Better, fairer, more meaningful research evaluation in seven hashtags <http://blogs.lse.ac.uk/impactofsocialsciences/2018/09/27/better-research-evaluation-in-seven-hashtags/> Then there is the question of whether to use metrics or narrative. If a simple, number based system of measuring impact could be developed it would probably assume as much importance as the measurement of publications and citations, but nobody has developed such a system; and it’s almost certainly impossible to do so. Thus a near consensus has been reached that “narratives with numbers” is the best method. <https://blogs.bmj.com/bmj/2018/07/30/richard-smith-measuring-research-impact-rage-hard-get-right/> It’s Time to Make Business School Research More Relevant <https://hbr.org/2018/07/its-time-to-make-business-school-research-more-relevant> …Many universities are “waking up to the fact that the PhD is not a good training model for academics.” …in Australia once somebody leaves the publishing cycle it is generally harder to come back in. <http://campusmorningmail.com.au/news/in-conversation-with-tanya-monro/> Research Excellence and Scholarly Publishing <https://soundcloud.com/user-466792516/research-excellence-and-scholarly-publishing> Why don’t more low-quality patents get rejected? A recent paper published by the Brookings Institution offers fascinating insights into this question. Written by legal scholars Michael Frakes and Melissa Wasserman, the paper identifies three ways the patent process encourages approval of low-quality patents: The United States Patent and Trademark Office (USPTO) is funded by fees and the agency gets more fees if it approves an application. Unlimited opportunities to refile rejected applications means sometimes granting a patent is the only way to get rid of a persistent applicant. Patent examiners are given less time to review patent applications as they gain seniority, leading to less thorough reviews. <https://arstechnica.com/tech-policy/2017/12/these-experts-figured-out-why-so-many-bogus-patents-get-approved/> <https://arstechnica.com/tech-policy/2019/03/theranos-how-a-broken-patent-system-sustained-its-decade-long-deception/> In peer review we (don’t) trust: How peer review’s filtering poses a systemic risk to science <https://www.researchers.one/article/2018-09-17> Ten myths around open scholarly publishing <https://peerj.com/preprints/27580/> What about scientists complaining about a system that is trying to micromanage them? Is the new assessment system we are promoting serving us better than the old system? We don’t want all academics to be writing only for academics, but that should still be an important part of their work. Discovery-led science is still something we want to support. What we are talking about is about finding the right balance. And across Europe, in the US and in many other countries, we’re seeing a shift towards more applied and impact-oriented research. If we tip the balance so far that suddenly there’s not enough discovery-led science taking place, it would be damaging. To keep that balance right is a perennial question of research policy. There’s no correct answer. Any guidelines on how to keep that balance? If we take a step back and we consider the scale of the scientific academic enterprise, the extent to which it has grown over the past 30 years, I think it’s right to ask the question: are we seeing a corresponding increase in the contribution of that activity to meeting the really pressing needs of our economy and society? That’s the big policy funding question. Of course, people are going to be nervous and resistant to changing the incentive system, but more must be done to ensure that the investment that we, as countries, are making in science and research is really delivering what we need. <https://observatoriosociallacaixa.org/en/-/entrevist-james-wildson>
* All PhD, postdoc and EMCR professional development should include education on HOW to translate (for policy or to underpin the research of others) or commercialise (for profit), their research. This education would include project management. In this way, if a research waste is reduced as specific insight and questions are asked (and should be answered) about their research and research is planned and managed with a QPI not just to a KPI from the university.
* broader than data – all research contents including materials, code, and other research contents, products, and process.
* translation of research into practice
* There needs to be greater support for early career researchers (ECRs) to work on innovative projects and opportunities to network with well established researchers (limited opportunity with NHMRC Fellowships, etc). Engagement of ECRs with reputable journal editorial boards / working alongside journal editors should be further promoted (this will increase understanding of research quality and help to avoid predatory journal use).
* Greater support for statistical consultancy groups in Health Faculties. These are often underfunded and highly dependent on grant success when this is an important core discipline and so should receive core funding to ensure statistical education is a top priority.
* Resetting academic incentives to favour robust, reproducible research over high profile, big splash projects
* Be careful of funding based on national burden of disease - research into ‘rare’ diseases is even now difficult to fund but such research leads to important health economic insights (these are cumulatively among the most costly burdens on the health system) and major advances in basic science (e.g. cystic fibrosis/congenital hyperinsulinism of infancy and ion channels)
* At a very grass roots level, all researchers who are involved in human research should have minimum training requirements (e.g. Good Clinical Practice training; data management/statistical methods knowledge - not just ‘how to’ but ‘why’ as well to ensure that practices such as mining for p-values and poor research conduct is discouraged). I know this won’t stamp it out entirely, but it would be a start. Journals also need to get tougher with authors and need to ask for more proof that the study has been conducted rigorously.
* Extend the last option beyond trials - that all types of research be registered. Also funding to automation of research synthesis - failure to know what we already know is holding us back, but doing manually is too slow.
* Greater funding for research and practice partnerships

## Please share the policies or practices that you use in your own research to maximise research quality. If there are none then please write ‘None’. All answers are anonymous.

13 researchers said None, Unknown or Unsure.

* Program of research; not individual projects. This must include SR, point prevalence, piloting, etc, prior to RCTs. Leadership by the necessary stakeholders - including consumers. Long-term collaboration with statisticians and HEs
* Follow reporting guidelines. Think about the end-user
* Use of existing policies uni and external and resources e.g. EQUATOR and other research guidelines
* Sharing code, data, additional study materials, and preliminary presentations in public repositories.
* Not buy into the perverse incentives of ‘prestige pandering’ in academia. Read a typical mini-bio of a senior academic and it’s often about academic credentials and traditional esteem measures (that are obscure to the general public), not what genuine benefits the research has had for the wider community, which includes training other researchers and the impact that has had on their lives and beyond. For example: “He was eminent in his field. But for me, his real impact was in his role as a mentor to students.” <https://www.nature.com/articles/d41586-018-06959-0> Does More Achievement Make Us Better Physicians? The Academic Arms Race <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2672578>
* Sharing data and code whenever possible. Thinking about end users early in the process. Being honest about things that went wrong. Writing a study protocol. Presenting initial results in a blinded/scrambled format to reduce the impact of conflicts of interest
* Being prepared to change my view of the world if compelling data falsifies my prior hypothesis.
* Statistical teaching sessions *GitHub* pipelines. In-group project proposal and constructive critique. Training in basic research methods
* Construct a research strategy map prior to commencing research to avoid grant chasing and to maximise successful outcomes. Do not rely on chance (grant) funding. Employ project management practices and design a budget to complete the project properly rather than piecemeal funding. Then I find the $ to match the study design.
* Publishing open access. Making data available. Using reporting guidelines
* Peer review of protocol/proposal through at least two different entities (grant review, research initiative review). Registering trial and outcomes prospectively. Publishing protocol.
* Scrutiny by senior statisticians of (almost) all manuscripts before submission to journals
* Our institute has provided tools and information to encourage better experimental design (e.g. structured randomisation). Training of subjective measures and review from an independent expert prior to publication. I now insist all data be presented as scatter plots rather than bar graphs.
* Sharing code that I used for analysis (as I don’t ‘own’ the data that I worked with so far, I was not able to make the data open. but some of the data I used is accessible to researchers anyway upon request). Reporting of studies according to guidelines (e.g. STROBE or CONSORT or PRISMA). Analysing data according to previously defined research questions or hypotheses. I would never re-analyse ‘null’ results until they are not null results any longer. Talking to fellow researchers to use statistical programs that allow to write a code that can be saved, improved and re-run as often as necessary (instead of using drop-down menus or instead of using Excel and pretending that this is a statistical program). I am still an early career researcher, but I try to oppose research practices of senior researchers that I think are not okay (e.g. putting some quite random authors that did not contribute to the manuscript on the author list, re-analysing the data to find nicer results…) mostly by asking why they want to do that.
* Preregister predictions on the Open Science Framework, along with experiment code, de-identified data, and analysis scripts in RMarkdown. Publish preprints on arXiv repositories.
* ICH Good Clinical Practice National Statement
* Involving health consumers with lived experiences in research design and throughout the research study as experts. Only presenting at research conferences when a paper has been submitted to a journal (under review). Peer review of research design by an external researcher
* Guidelines for research conduct and reporting (e.g. CONSORT, PRISMA)
* I ensure that I refer to the appropriate guidelines (CONSORT, STROBE, PRISMA, etc.) when conducting and reporting my research. I use clear statistical analysis plans prior to conducting my analysis. I share my data preparation and analysis code with other researchers involved in the study (although this could perhaps be shared more widely). I ensure that the code is appropriately annotated to justify decisions made. I conduct sensitivity analyses to determine how sensitive my findings are to different assumptions. I write up and try and publish null findings. Systematic reviews and trials that I am involved in are registered.
* Training programs for EMCRs. Mentoring networks. Engaging consumers in project
* 1. Stringent use of appropriate standards of reporting (CONSORT, STROBE, ARRIVE etc to be found on the EQUATOR website FROM THE DESIGN STAGE 2. Statistical analysis must be performed using code rather than ‘point and click’ so that analysis is reproducible and records all data used/not used 3. Write clearly testable hypotheses and a statistical analysis plan at the design stage
* Set procedures for data management and analysis that are followed by all staff. Documentation rules
* Reporting guidelines. Employ good quality researchers. Train PhDs carefully.
* We engage a statistician at the very outset to ensure methodological rigour. We have recently started engaging more with patients to ensure that our outcomes are patient important. The initial research idea comes from the clinical area we work in (through communications with clinicians to identify clinical practices in need of improvement/refinement; or analysis of patient safety data/sentinel events) - so hopefully the research is relevant to clinicians who are caring for the patients, and the patients themselves.
* Use appropriate controls. Minimise Animal health burden and impacts. Using appropriate health models.
* Systematic reviews before new research (done used automation tools). Protocol templates for research protocols and papers. Training of all research staff in research and synthesis methods.

## Please share the policies or practices that your institution have already implemented to maximise research quality. If there are none then please write ‘None’. All answers are anonymous.

13 researchers said None, Unknown or Unsure.

* Availability of talented statisticians and HE. Good data management software
* variety of policies and regular stream of workshops to provide training re specific research skills and methodologies available to students and staff
* Research Data Manager (RDM) <https://research.uq.edu.au/rmbt/uqrdm>
* Training in research ethics. Training on predatory journals. Training and help available on data deposition
* Statistical unit and statistics teaching. Data warehousing
* Training of HDRs. Specific sessions on a publication practices
* Peer review
* Audit of randomly selected projects. Examining ethics and data management issues
* Not much. [XXX] is moving toward using in-house software, which is less about making research open and transparent and more about risk management.
* Internal SOP Internal Audits
* Regular research workshops on various topics. Regular workshops for supervisors (and supervision accreditation)
* Large focus of conduct of ethical research.
* Publication incentive scheme KPIs for clinical/biomedical collaboration. Guideline for consumer engagement in research biostatistics/epidemiology support for researchers. Structured mentoring programs. Peer support for EMCRs
* It is very ad hoc and depends on the experience and research education of the lead investigators
* Introduction of governance frameworks relating to the conduct of clinical trials to ensure safety and standards of care.
* None - which is appalling. There are no minimum requirements set at an institutional level - the onus is wholly and solely on the investigator to ensure that they do the right thing, and unfortunately there are investigators who are only driven by publications and accolades, with only passing acknowledgement to how their research will improve things for patients.
* Research Integrity training

## What is your broad area of research?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Missing | Basic Science | Clinical Sciences | Health Services Research | Not a researcher | Other | Public Health |
| 9 | 5 | 7 | 16 | 1 | 8 | 7 |

1. This was a red-herring; the aim of this meeting is to focus on what researchers can do [↑](#footnote-ref-1)